

REMARKS

No claims have been cancelled. New Claims 27—32 have been added. Accordingly, claims 1—6, 8—9, 11, 24—25 and 27—32 are pending. In view of the following remarks, withdrawal of the rejections to the pending claims is respectfully requested.

Amendments to the Specification

The equation at page 11, line 18 has been amended to replace " p_1 " with " p_i " to the left of the equals sign. Fixing this typo keeps this equation consistent with the discussion of p_i in the middle of page 11. Also, a typo was fixed by adding a left parenthesis immediately to the right of the equals sign.

The equation at page 12, line 24 has been amended to add a subscripted "i" to the "p" in the summation. The summation is indexed by i, and obviously requires the subscript i. Also, the equation at line 24 must be made to be mathematically consistent with the equations at page 12, line 4 and at page 12, line 11.

The equation at page 13, line 5 has been amended to add a subscripted "i" to the "p" in the summation. The summation is indexed by i, and obviously requires the subscript i. Also, the equation at line 5 must be made to be mathematically consistent with the equations on page 12.

The §101 Rejections

Claim 1 has been amended to recite the limitation that the method is at least partially implemented by a computing device (for example, a computer). Since

1 claims 2—6, 8, 9 and 27—32 depend from claim 1, the Applicant believes that the
2 rejection has been addressed for all of the claims.

3 4 **Double Patenting**

5 The Applicant asserts that the claims of the 11/082,390 application are
6 distinguished from the instant application at least by the fact that claim 1 in the
7 instant application includes a preamble with three paragraphs and claim 1 in the
8 11/082,390 application includes a preamble with two paragraphs.

9 The Applicant asserts that the claims of the 11/082,392 application are
10 distinguished from the instant application at least by the fact that claim 1 in the
11 instant application recites a “method, at least partially implemented by a
12 computing device, for processing a database query, comprising:” while claim 1 in
13 the ‘390 application recites “One or more computer-readable media comprising
14 computer executable instructions for processing a database query, the computer-
15 executable instructions comprising instructions for:”.

16 17 **Traversal of the §103 Rejections, Hoa in view of Agrawal**

18 Claims 1, 2 11 and 24 stand rejected under 35 U.S.C. §103(a) as being
19 obvious over Pat. No. 6,282,541, hereinafter “Hoa,” in view of U.S. Pat. No.
20 5,832,475 hereinafter “Agrawal.” In response, the Applicant respectfully traverses
21 the rejection.
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1 **Claim 1** recites a method, at least partially implemented by a computing
2 device, for processing a database query, comprising:

- 3 • partially pre-aggregating records in a database to provide a result that
4 contains at least two records having like grouping column values;
- 5 • aggregating records derived from the partial pre-aggregation to
6 provide a result that contains records having unique grouping
7 column values; and
- 8 • partially pre-aggregating the records **only if an estimation, based in
9 part on a calculation of a probability that a record will be
10 absorbed by a group of records already in memory, indicates
11 that a number of output records from the partial pre-
12 aggregation will be significantly less than a number of input
13 records to the partial pre-aggregation.**

14 The Hoa Reference

15 The Hoa reference does not teach or suggest elements recited by Claim 1.
16 Hoa fails to teach or suggest an estimation of a number of records, whether input
17 records, output records or other records. More particularly, the Hoa reference does
18 not teach or suggest partially pre-aggregating the records “only if an estimation,
19 based in part on a calculation of a probability that a record will be absorbed by a
20 group of records already in memory, indicates that a number of output records
21 from the partial pre-aggregation will be significantly less than a number of input
22 records to the partial pre-aggregation”.

23 The Patent Office acknowledged that Hoa does not disclose cost and benefit
24 estimation, generally. In response, the Patent Office cited Agrawal as a reference
25 that teaches aspects of costs adapted for group-by calculations.

Agrawal Does Not Remedy the Failings of Hoa by Teaching or Suggesting
the Recited Claim Limitations

Assuming, arguendo, that there was motivation to combine the Hoa and Agrawal references, and that there is an expectation of success for such a combination—both assumptions that the Applicant respectfully rejects. Even under such an assumption, Hoa, Agrawal, and a combination thereof, fail to teach or suggest partially pre-aggregating the records “only if an estimation, based in part on a calculation of a probability that a record will be absorbed by a group of records already in memory, indicates that a number of output records from the partial pre-aggregation will be significantly less than a number of input records to the partial pre-aggregation”. Accordingly, the combination of Hoa and Agrawal is deficient, since the combined prior art references must teach or suggest all the claim limitations. *In re Royka*, 490 F.2d 981, 180 USPQ 580 (CCPA 1974).

Agrawal teaches an estimation of the size of a group-by command (see column 15, lines 1—5). Based on the size of the command and available memory, an appropriate algorithm can be selected (see, column 16, lines 53—56). Thus, Agrawal discloses aspects of cost, which are based projected memory requirements, and selecting between algorithms based on the projected memory requirements and known memory availability.

Agrawal teaches that the number of tuples in a group-by operation can be estimated (see column 15, lines 39—45). Additionally, Agrawal teaches that such estimates can be used to change algorithms within a group-by operation (see column 16, lines 8—12).

However, Hoa and Agrawal fail to teach or suggest an estimation based in part on “probability that a record will be absorbed by a group of records already in

1 memory”. Instead, Agrawal uses a formula based on attributes and distinct values
2 for an attribute (seen at column 15, lines 39—45). Thus, Hoa and Agrawal, singly
3 and in combination, fail to teach or suggest “an estimation, based in part on a
4 calculation of a probability that a record will be absorbed”.

5 Additionally, Hoa and Agrawal fail to teach or suggest comparison of a
6 number of input records to a number of output records. Hoa makes no such
7 comparison. Agrawal uses only the current estimated number of records. This
8 estimate allows calculation of memory size requirements (see generally, column
9 16) and selection of an algorithm that uses the least memory (see column 16, lines
10 53—56). However, Agrawal does not teach or suggest comparison of a number of
11 input records to a number of output records. Thus, Hoa and Agrawal, singly and in
12 combination, fail to teach or suggest *taking any action* when an estimation
13 indicates that “a number of output records ... [is] ... significantly less than a
14 number of input records to the partial pre-aggregation”.

15 Accordingly, the combination of Hoa and Agrawal has been shown to be
16 deficient in teaching and/or suggesting the elements recited by Claim 1. The
17 Agrawal reference was cited to remedy the deficiencies of Hoa; however, Agrawal
18 has failed to teach or suggest at least two elements recited by the claims. First,
19 Hoa and Agrawal fail to teach or suggest making an estimate “based in part on a
20 calculation of a probability that a record will be absorbed by a group of records
21 already in memory”. Second, Hoa and Agrawal fail to teach or suggest taking
22 action when an estimate “indicates that a number of output records from the partial
23 pre-aggregation will be significantly less than a number of input records to the
24 partial pre-aggregation”. Accordingly, elements recited by the claims are not
25 taught or suggested by the combination of Hoa in view of Agrawal, and rejections

1 based on this combination are improper. Accordingly, the Applicant respectfully
2 requests that the Patent Office remove the section 103 rejection of Claim 1.

3 **Claims 2—6, 8, 9, 11 and 27—32** depend from Claim 1, and are allowable,
4 at least by virtue of this dependence. These claims are also allowable for their own
5 recited features that, in combination with those recited in Claim 1, are not
6 disclosed by reference of record.

7 **Claim 24**, as amended, is allowable for at least the reasons Claim 1 is
8 allowable. Accordingly, the arguments recited in the traversal of the rejection of
9 Claim 1 are hereby incorporated by reference.

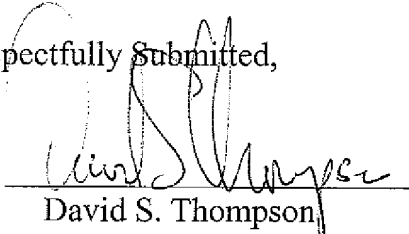
10 **Claim 25** depends from claim 24, and is allowable by virtue of this
11 dependence, as well as for reasons associated with the elements recited by that
12 claim.

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14 **Conclusion**

15 The Applicant submits that the claims as presented are in condition for
16 allowance. Accordingly, the Applicant respectfully requests that a Notice of
17 Allowability be issued. If the Patent Office's next anticipated action is not the
18 issuance of a Notice of Allowability, the Applicant respectfully requests that the
19 undersigned attorney be contacted to schedule an interview.

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22 Date: 4-3-06

Respectfully Submitted,

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